Dimplex

Installation and Operating Instructions

ZW 05 DCU

Universal Microprocessor-Driven Charge Control (0.91 to 1.43 V and -3.60 to -2.85 V DC)

with Timer Function

Microprocessor-driven charge control (DC-universal) for underfloor storage heating and electric storage heaters with DC charge control (output signal 0.91 to 1.43 V and -3.60 to -2.85 V DC).

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Unit Description

The ZW 05 DCU microprocessor-driven charge control controls the charging of an underfloor storage heating and/or the charging of storage heating devices according to outside temperature, settings and control signals.

It has the following features:

- Charging according to external temperature,
- Initial heating program for screed flooring,
- Timer function for backward, intermediate and forward control,
- Priority and secondary use of actual service release periods for low and high tariffs,
- Adjustable detection of service release period (charge release detection)
- Direct control via charge control line Z1+/Z2- is possible,
- Automatic correction of charging during extreme temperature fluctuations (daytime and night-time temperatures) in transition periods, via external temperature averaging,
- Characteristic curve switching via external control is possible,
- Large, back-lit, alphanumeric multi-function display showing operating status and service information,
- All utility company requirements can be met,
- Optional connection to NTC or older PTC external sensors,
- Real-time timer to lower charging (weekly programme and absence of up to 30 days).

Scope of delivery

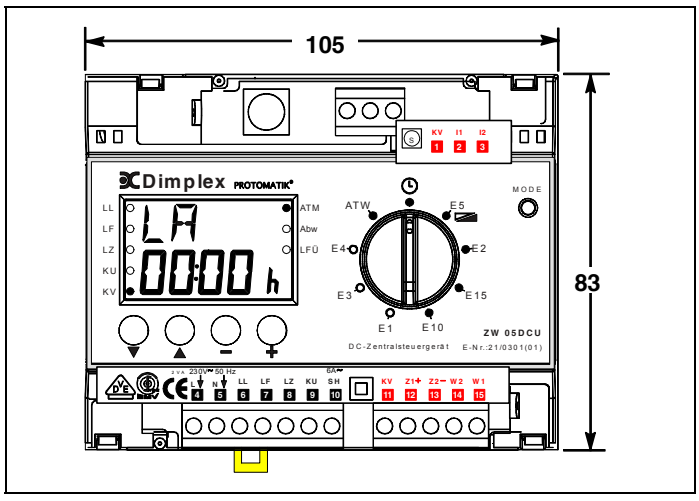
- The ZW 05 DCU microprocessor-driven central control unit
- NTC external sensor with 2 m connecting lead
- Installation and operating Instructions

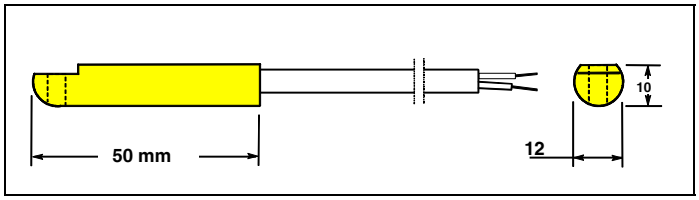
Technical Information

ZW 05 DCU microprocessor-driven charge control	
Connection voltage	1/N/ 230 V AC ~ 50/60 Hz
Power consumption	Approx. 2 VA
Reference variable at the Z1+, Z2- terminals:	0.91 V to 1.43 V DC, safety overlap to 1.68 / 1.95 V
Reference variable at the I2, I1 terminals:	-2.85 V to -3.60 V DC, safety overlap to -4.35V
Number of charge controllers that can be activated	100 maximum
Power reserve	Approx. 6 hours (runtime and timer)
Switching capacity of safety output	6A, 230 V ~
Ambient temperature	Between 0 °C and 50 °C
Protection class	II according to installation (see section on “Installation”)
Degree of protection	IP 20, according to DIN 40050, according to installation
Standard	DIN EN 50350 and DIN 44576 (draft)
Space requirements	6 x DIN 43880 modular spaces
Attachment	Top hat rail
Connection terminals	15, cross section 2.5 mm²
Dimensions	See dimension drawing
Weight	Approx. 320g

External sensor

Sensor type	NTC sensor according to DIN EN 50350 in insulated casing
Connecting pipe	2 m long (extendable up to a maximum of 30 m)
Protection class	II according to DIN EN 60730-1
Degree of protection	IP54 according to DIN 40050
Dimensions	See dimension drawing





Operating Instructions for Users

General Information

For installation, operation and maintenance, please observe these installation and operating instructions. This unit should only be installed and repaired by an experienced technician. Poorly carried out repairs can endanger the safety of the user. In compliance with VDE (association of German engineers) regulations, the installation and operating instructions must always be available and should be given to the technician working on the unit for his/her information.
Should ownership change, these installation and operating instructions must be passed on to the new user or owner.

This is how your heating system works

The local utility company makes electricity available for electrical heating purposes during periods in which other customers require little or no electricity – so-called off-peak periods.
Utility companies offer electricity at discounted tariffs primarily during the night-time release period. In certain service areas, electricity for heating purposes is additionally available during the daytime – the so-called additional release period. For release and additional release periods, the tariff conditions may vary. Information can be obtained from your authorised electrician or local utility company.
The specified charging periods are generally released via a control unit (ripple control receiver or timer) by the utility company. The ZW 05 DCU microprocessor-driven charge control ensures consumption-based charging of your storage heater.
To ensure the utility company's technical connection requirements are met, your electrician will carry out the precise setting of all required values on the central control unit and the charge controllers.

Central control and charge controller

The ZW 05 DCU microprocessor-driven charge control measures the weather conditions and the inertia of the building, via the external sensor located in the brickwork. This reference variable is connected to the various settings, runtime and, depending on the signals of the control terminals, to the central control unit's output variable (set charge rate = control voltage to Z1+/Z2- or I1/I2). The control voltage is transferred to the electronic charge controller, which functions as the ON/OFF controller.

For underfloor storage heaters, the controller set point is determined by the amount of applied control voltage and position of the intensity actuator E8/KT (daytime) or E7/KN (night-time) on the charge controller. The actual value of charging for any heating circuit is displayed on the charge controller via the residual heat sensor in the insulating screed. For storage heaters, the controller set point depends on the applied control voltage and the position of the charge selection button.
The actual value of charging is determined via the residual heat sensor by measuring the core temperature. The charge controller compares the set point with the actual value and, if necessary, switches on the charging until the required heat content is reached.

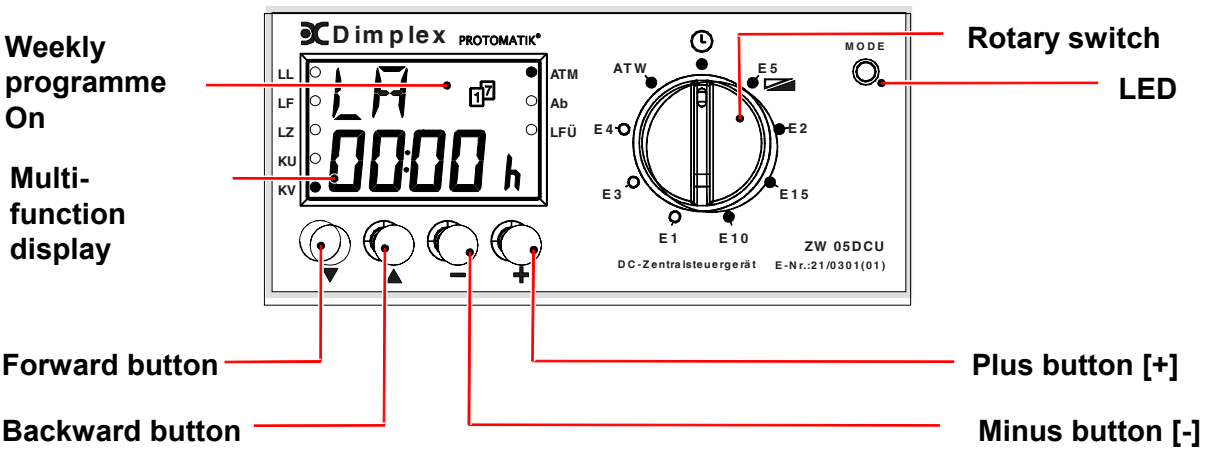
Setting the charge controller of an underfloor heater

Night-time charging (E7/KN) and daytime charging (E8/KT) can be corrected for each heating circuit via the charge controller. Night-time charging affects the room temperature during the early morning and late morning, whereas the daytime charging affects the room temperature in the afternoon. Setting information can be found in the corresponding operating manual.

Setting the intensity actuator (charge selection button) on a storage heater

During automatic operation, the intensity actuator is set at the right-hand stop (factory default), i.e. the storage heater charges at the value specified by the ZW 05 DCU microprocessor charge control.
In areas with reduced heating needs, e.g. bedrooms, charging of the storage heater can be reduced and the storage heater adjusted by turning the charge selection button to the left. No charging takes place at the left-hand stop.
During automatic operation operating errors and unintentional re-setting can be prevented by removing the controller button from the storage heater's intensity actuator and covering with the closing cap.
Should no charging of the storage heater be necessary in the summer months (even on cooler summer nights), we recommend taking the entire heating system out of operation. For more information consult your authorised electrician. Please observe the technical connection requirements of your local utility company.

The heat storage capacity of the entire heating system can be raised or lowered at the charge control.

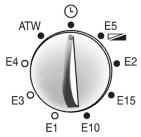
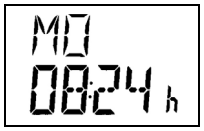
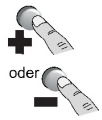


Input Menu for Users

During normal operation, the unit is in operator mode. The “mode” LED does not light up.

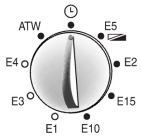
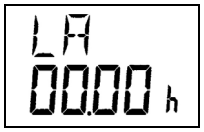
Therefore, the menu item shown in the display depends on the position of the rotary switch as well as the setting of the ANZ (display) menu item. During normal operation, the individual menu items of the operator menu can be accessed with either the forward button [▼] or the backward button [▲]. Individual menu items can also be directly obtained via the rotary switch. **Adjusting** the **flashing setting parameters** is possible via the **"plus" [+]** or **"minus" [-]** buttons.

Changes will be made automatically with this adjustment. If 3 minutes should elapse and no adjustment has taken place, the control unit automatically changes back to the selected display status and the changes saved.

Menu item / display	Comment	Adjustment
 	Time and day of the week are displayed in the operating mode “timer function” UHR = JA (timer = yes) and ANZ (display) = Uhr (timer) or ANZ (display) = AU (off)	

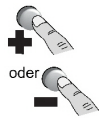
START Operator Menu

Runtime LA

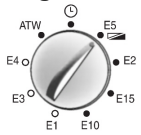
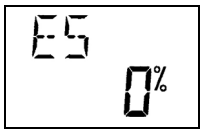
 

Displays time elapsed since the start of night-time charging release period (start of the charge release LF)

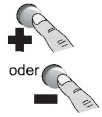
(Note: during active release synchronisation with timer (FSU) = JA (yes), runtime adjustment is locked.)



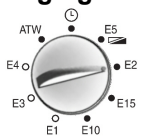
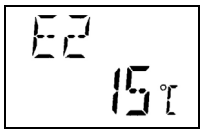
Charge level E5

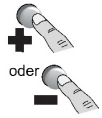
Changes to the basic charge level of all storage heating systems connected to the charge control. The set charge can be either proportionally raised or lowered by 30%, according to need. The change to the charge level should only be made gradually, since the effect of these changes will only become apparent after the unit has been charged.



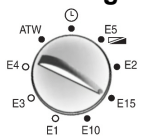
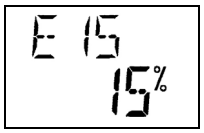
Charging start E2

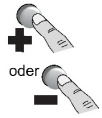
Specifies the effective external temperature (ATW) at which storage heater charging should begin. (The higher the selected setting, the sooner charging will start and, thus, the higher the set charge amount is at the same effective external temperature ATW).



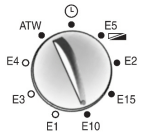
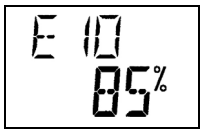
Base charge start E15

Specifies the minimum charging base to which the effective external temperature may fall when set according to E2.
Recommended setting:
Insufficient charging in the transition period: raise E15 by 5% to 10%.
Excess charging in the transition period: lower E5 by 5%.

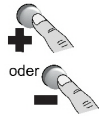


Additional charging (daytime charging) E10

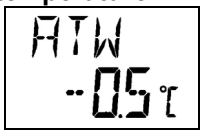
 

Reduction or increase of an available daytime recharging E10 = 0% means no recharging in the afternoon, independent of the effective external temperature.

Note: In the event that the daytime charging via the TAS (daytime skip) adjuster (TAS = E1 or TAS = TE; only technician has access) with higher effective temperatures is fundamentally disabled, then the E10 adjuster is ineffective above these temperatures.



Effective external temperature ATW



Displays the effective temperature at external sensor location

ATM (external temperature averaging) = 1:
ATW (effective external temperature) refers to the averaged temperature
ATM (external temperature averaging) = 0:
ATM corresponds to current temperature

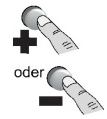
Not possible

Operator Menu (continued)

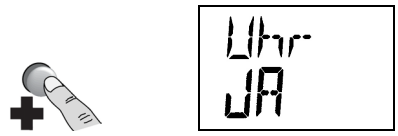
Menu item / display	Comment	Adjustment

Real-time – timer

The microprocessor-driven charge control is equipped with a real-time function (weekly programme) (Uhr (timer) = JA (yes)). This can be utilised either strictly as additional information or for automatic charge lowering during longer periods of absence and/or according to the weekly programme. This offers the additional possibility, in connection with the FSU (release synchronisation with timer) = JA (yes) function, to release or individually conceal time-controlled charging independent of the time in areas without release signal.



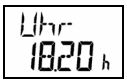
Note: This can no longer be switched off after the real-time timer has been activated!

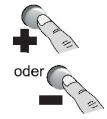


Extended runtime function (real-time function) is activated

Setting the time

Setting the current time

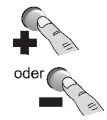




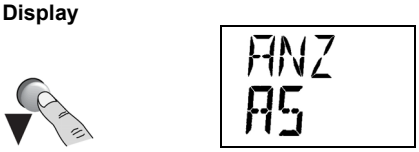
Day

Setting the current day of the week:

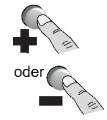
T1 = Monday	T5 = Friday
T2 = Tuesday	T6 = Saturday
T3 = Wednesday	T7 = Sunday
T4 = Thursday	



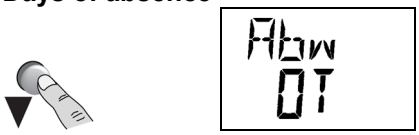
Display



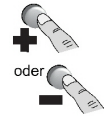
Selection of desired display mode in normal operation ANZ (display) = AS (switch position indicator): display according to the position of the rotary switch ANZ (display) = Uhr (timer): displays the time and day of the week ANZ (display) = AU (switch position indicator, timer): automatic switching of display between rotary switch position and time/day



Days of absence

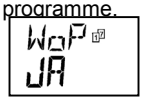


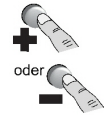
For the duration of the days selected (between 1 and 30), the KU (characteristic curve switching) is activated according to the KUT (characteristic curve switching, temperature) or KUP (characteristic curve switching, percent) setting parameters. After the period of absence has elapsed, the normal charge curve is switched back to.



Weekly programme

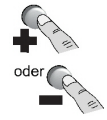
For cyclic user preferences, it is possible to choose between normal and lowered charging via the weekly programme. The active weekly programme is denoted in the display by the “Wochenprogramme” (weekly programme) symbol (WoP).





Day

When WoP (weekly programme) = JA (yes), the desired charge curve (normal or lowered charging) can be set to any day of the week (Mo – Su).
Nor: normal charging
KU (characteristic curve switching): reduced KU charging activated as of 8:00 pm on the previous day



End of Operator Menu

Changing to the technician menu in the display mode.

If the forward button [▼] be held down for approx. 10 seconds, the unit will switch to this mode. The LED display (green) is lit during display mode and the configuration settings can be accessed via the "▼" and "▲" buttons. Changing the settings is not possible.

If no button be pushed in the active display mode for a period of approx. 3 minutes, the unit will automatically return to operator mode after this time has elapsed. The display mode can also be ended by holding down the forward) button [▼] for 10 seconds. The menu item selected via the rotary switch will be displayed.

Installation and Operating Instructions for Technicians

Installing the central control unit

Installation may only be carried out by a technician authorised by the respective utility company. The regulations of the local utility company as well as the relevant VDE (association of German engineers) regulations are to be observed.

The unit requires 6 DIN 43880 modular spaces. Protection against accidental contact according to protection class II is ensured by:

- Installation in a small distribution board according to DIN 57603/VDE 0603 (e.g. N system distribution board)
- Installation in a distribution board according to DIN 57659/VDE 0659.

The charge control unit should be installed in the coolest location, i.e. the lowest mounting row of the distribution board. Please ensure a clearance of at least one modular space on both sides.

The unit comes complete with lead-sealable cover caps, which are to be used for installation in the installation distribution board only. These must be removed before installation.

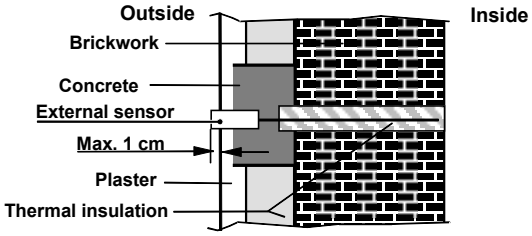
Installing the external sensor

The NTC external sensor should be installed at least 2 m over the floor in the outer brickwork, preferably within the zone of main use (for large systems), or in the room of main use (for single systems). The sensor should not be subject to direct sunlight. Heat sources (e.g. ventilation shafts or open windows) must not affect the sensor and, thus, the ZW 05 DCU microprocessor-driven charge control.
Please observe the following:

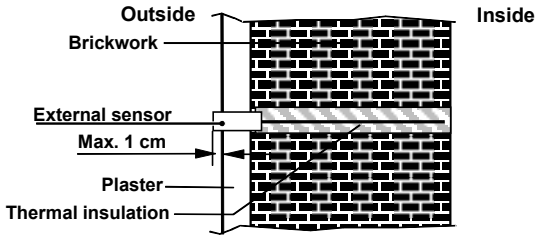
- The external sensor must be embedded in the mortar
- The cable feedthrough must be carefully protected with thermal insulating material.

The NTC external sensor contains a 2-m long connecting lead, which may be extended to a maximum of 30 m using an installation lead (1.5 mm² minimum).

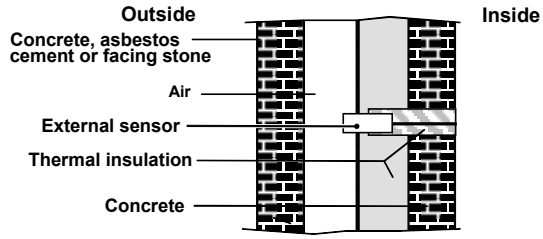
Wall with outside insulation



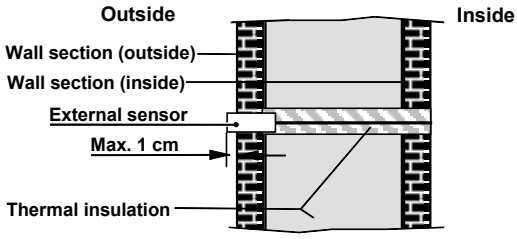
Wall with or without inside insulation



Wall with curtain-type façade



Wall of prefabricated house



Electrical connection

The circuitry stipulated by the local utility company may vary from these connection examples. The appropriate circuitry is normally listed in the utility company's technical connection requirements.

The LF (charge release), LL (runtime) and LZ (additional charging) terminals are to be wired in compliance with the utility company's requirements via floating contacts, e.g. a ripple control receiver or a tariff timer.

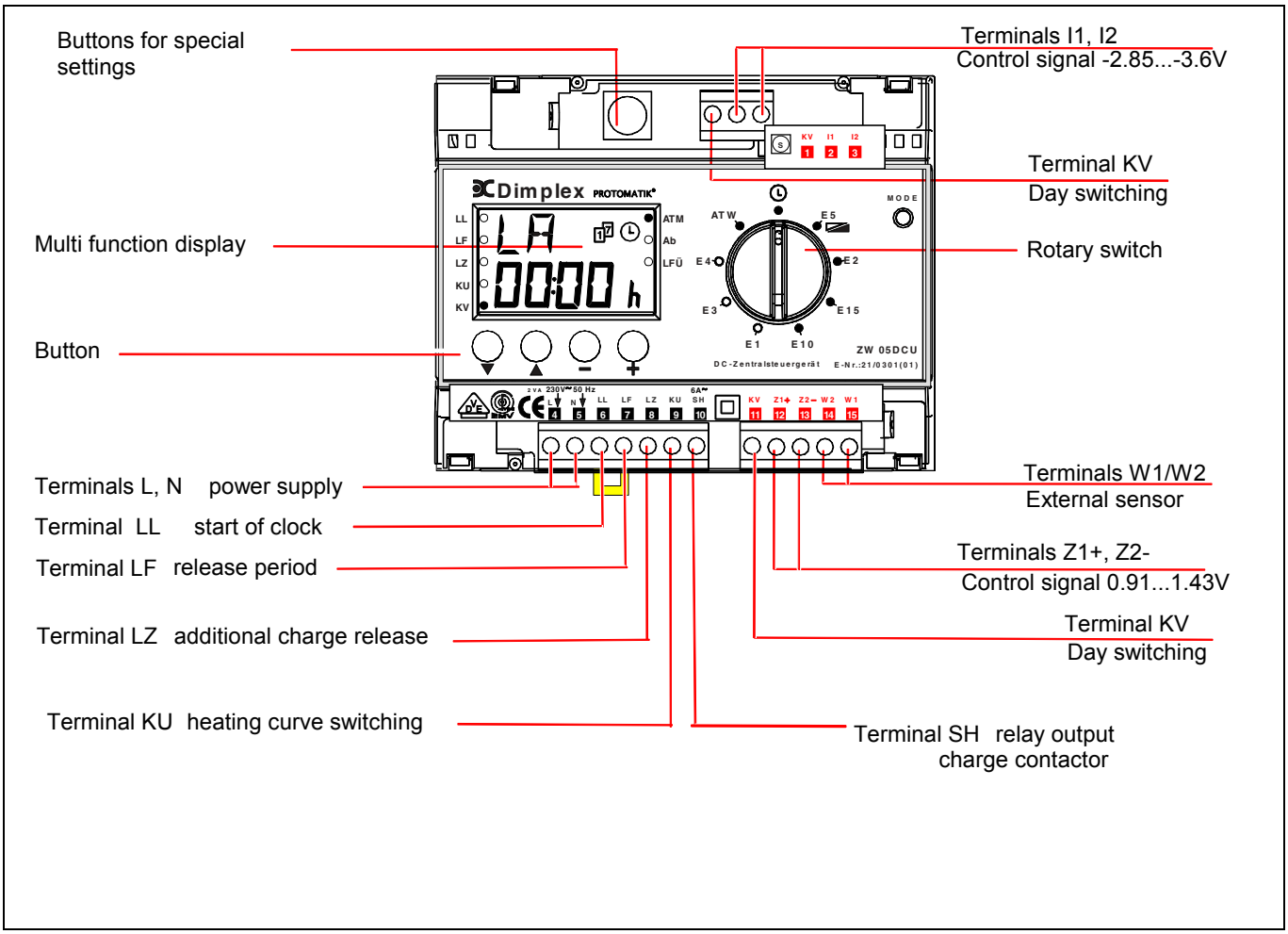
The central control unit permits connection of:

- 100 charge controllers maximum
- Any number of group control units, although the maximum total number of charge controllers or storage heaters in the system is limited to 100.

When connecting the ZW 05 DCU microprocessor-driven charge control, please observe the following:

- The **connections** at the **L and N terminals should not be interchanged**
- The **LL (runtime), LF (charge release), LZ (additional charging) and KU (characteristic curve switching) pilot wires** must be connected **in phase with L (charging)**
- Should a phase be connected at a red-marked terminal due to a mistake in the wiring, the unit will be destroyed.
- Control lines must be installed bifilar as per DIN 44573. According to the VDE (association of German engineers) directive 0100, these two wires may not be laid in one cable with network wires.

ZW 05 DCU Charge Control Set-Up



Explanation of multi-function display items

LL: Activated when LL terminal is activated

LF: Activated when LF (charge release) terminal is activated

LZ: Activated when LZ (additional charging) terminal is activated

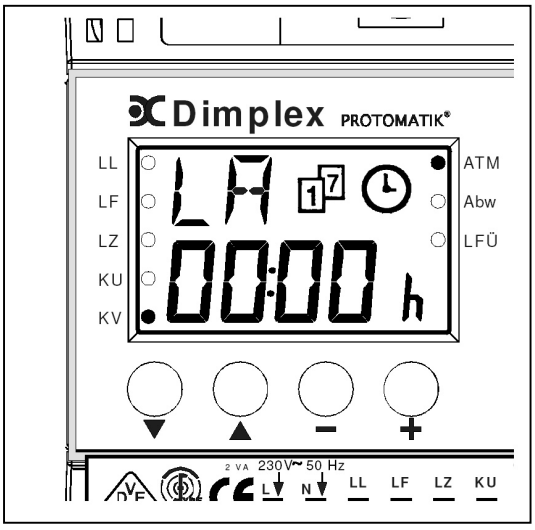
KU: Activated when KU (characteristic curve switching) terminal is activated

KV: Activated in the daytime characteristic curve (KV output)

ATM: Activated in external temperature averaging operation (ATM (external temperature averaging) = JA (yes)

Abw: Activated in period of absence (Abw) mode

LFÜ: Activated when runtime detection monitor is activated



17: Weekly programme display “WoP = Ja” (weekly programme = yes)

: “LSU = JA” (charge synchronisation with timer = yes)

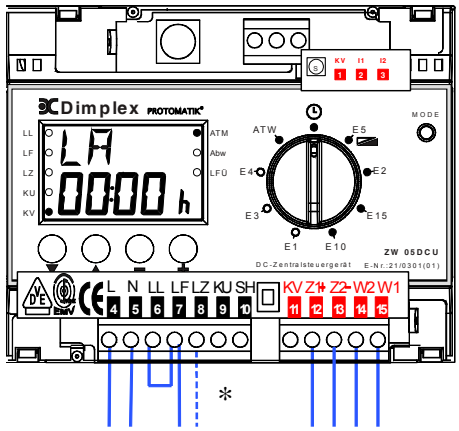
LED display operating mode:

If display is not lit – operating mode is active
Green light – technician menu display mode is active
Red light – technician menu setting mode is active
Briefly-lit orange light – software reset has occurred

Activation Examples for ZW 05 DCU Microprocessor-Driven Charge Control

Backward or intermediate control with timer function

Standard installation with heating contactor or direct control of electric storage heaters (via charge control line) without heating contactor.



“LF” (charge release) signal to LL (runtime) and LF (charge release) terminals

Voltage at “LF” (charge release) terminal:

- Output of the weather-dependent and run-time dependent control voltage (0.91 to 1.43 V)
- Time function element activated (timer is running)

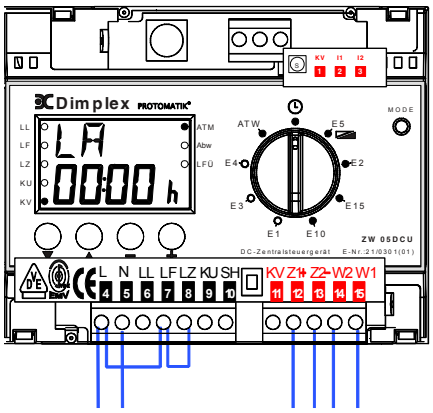
No voltage at “LF” (charge release) terminal:

- Safety overlap at 1.95 V control voltage (charge suppression)
- Runtime (LA) < locking duration SEH (lock): Timer element is deactivated (timer stopped)
- Runtime (LA) ≥ locking duration SEH (lock): Timer element activated (timer is running)

*For charge types with daytime charging periods and special LZ (additional charging) release signals, the “LZ” terminal must be activated
(Please observe the technical connection requirements of the utility company).

Forward control without timer function

Standard installation with heating contactor



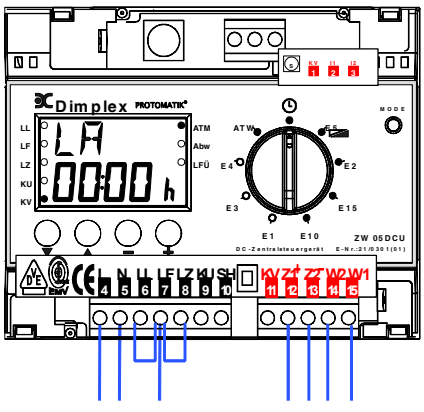
Remove LL-LF bridge and put bridges between L-LF and LF-LZ

- Output of the weather-dependent control voltage (0.91 - 1.43 V)
- Time function element is not activated (timer is stopped)
- Runtime display = LA (runtime) 0.00 hours

When this type of activation is used in connection with an underfloor storage heater, the runtime detection of the charge control should be switched off (menu item SHC (terminal output characteristic) = LF (charge release), LFU (charge release detection) = UMD (circulation period)).
In the case of a breakdown, an additional temperature limiter must be used to limit the storage layer temperature.

Forward control with timer function

Standard installation with heating contactor or direct control (via charge control) without heating contactor (only suitable for systems with storage heaters)



Laying LF (charge release) or SH (heating contactor activation terminal) release signal from utility company to LF terminal and bridging between LF and LZ

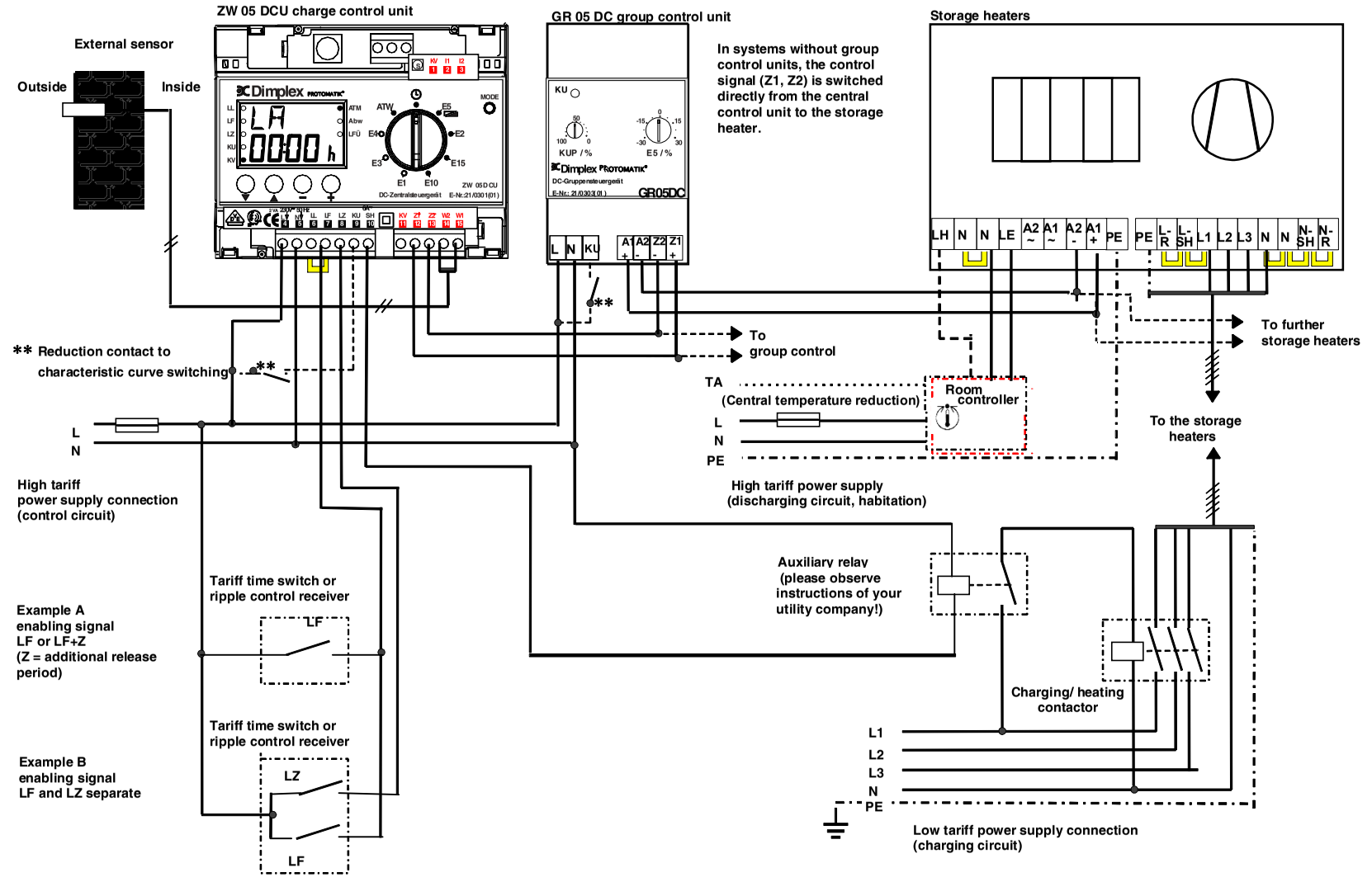
Voltage to “LF” terminal

- Output of the weather-dependent control voltage (0.91 – 1.43 V)
- Timer element activated (timer is running)

No voltage to “LF” terminal:

- Safety overlap to 1.95 V control voltage (charge suppression)
- Runtime(LA) < locking duration (SEH): Timer element deactivated (timer is stopped)
- Runtime (LA) ≥ locking duration (SEH): Time element activated (timer is running)

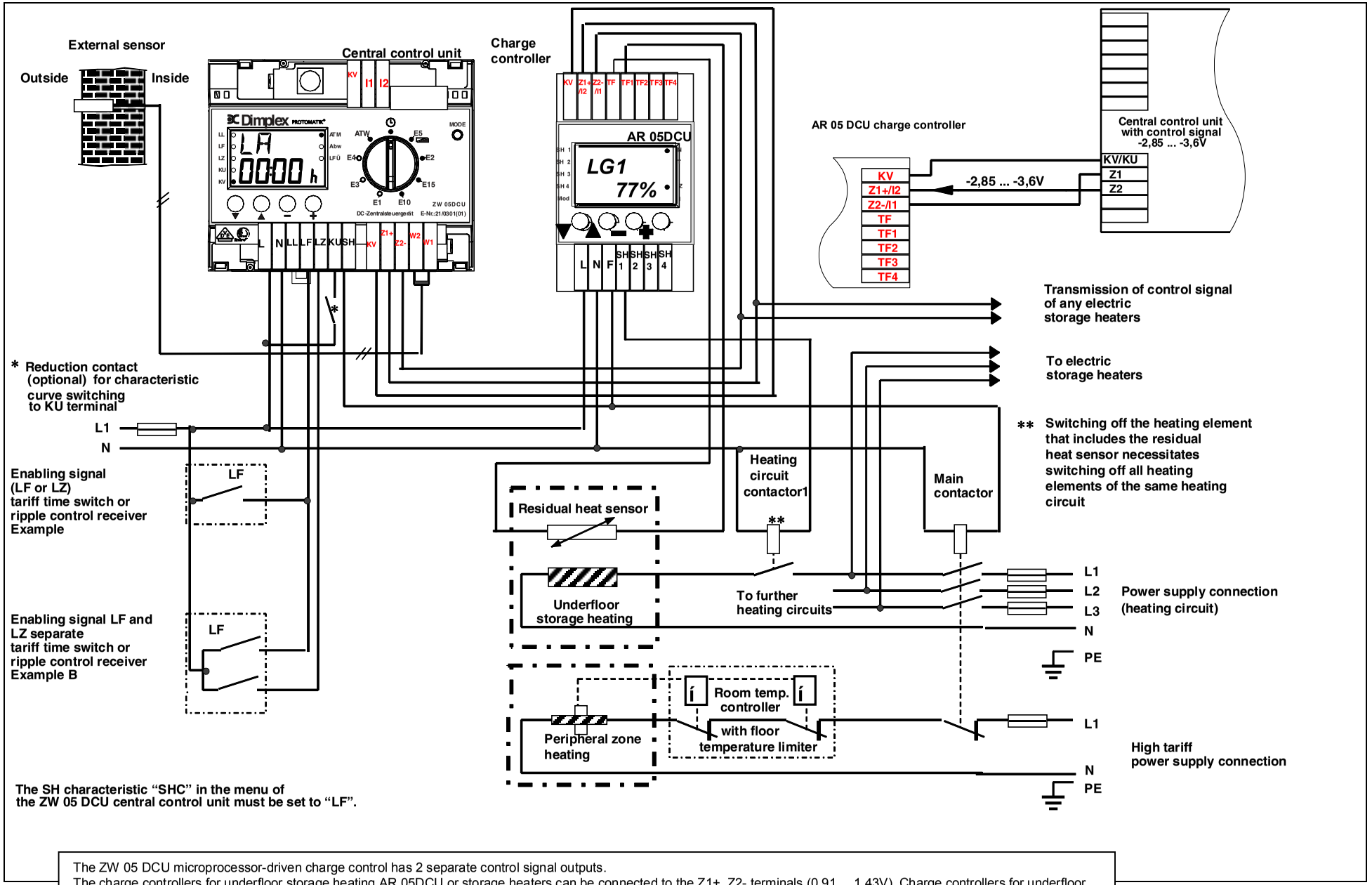
ZW 05 DCU connection diagram for electric storage heaters


ZW 05 DCU charge control unit
GR 05 DC group control unit
Storage heaters
External sensor
Outside
Inside
In systems without group control units, the control signal (Z1, Z2) is switched directly from the central control unit to the storage heater.
** Reduction contact to characteristic curve switching
To group control
To further storage heaters
To the storage heaters
TA
(Central temperature reduction)
Room controller
L
N
PE
High tariff power supply connection (control circuit)
High tariff power supply (discharging circuit, habitation)
Auxiliary relay (please observe instructions of your utility company!)
Tariff time switch or ripple control receiver
Example A enabling signal LF or LF+Z (Z = additional release period)
LF
Tariff time switch or ripple control receiver
Example B enabling signal LF and LZ separate
LZ
LF
Charging/ heating contactor
L1
L2
L3
N
PE
Low tariff power supply connection (charging circuit)

Switching from backward control to forward control via control of terminals LF and LZ.

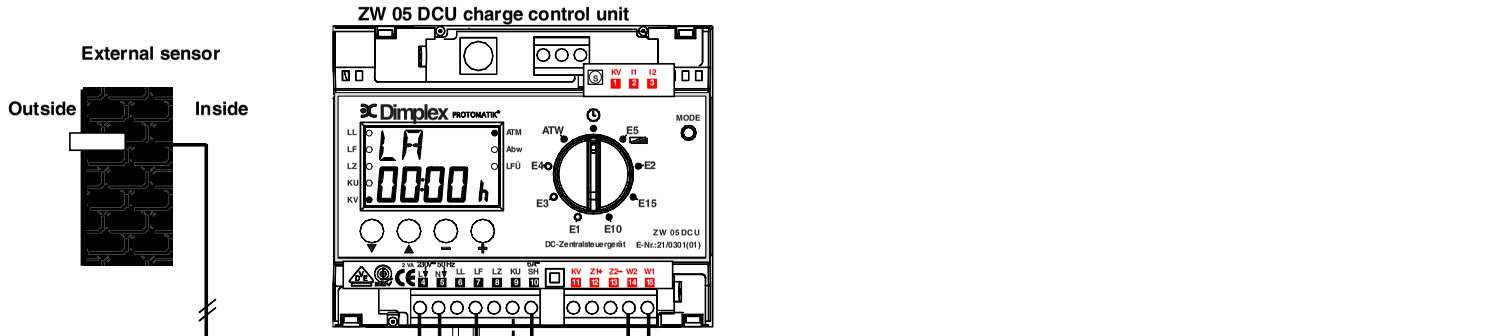
Control of terminal LL,LF and LZ varies according to utility company.
Please observe the technical connection requirements of your utility company.

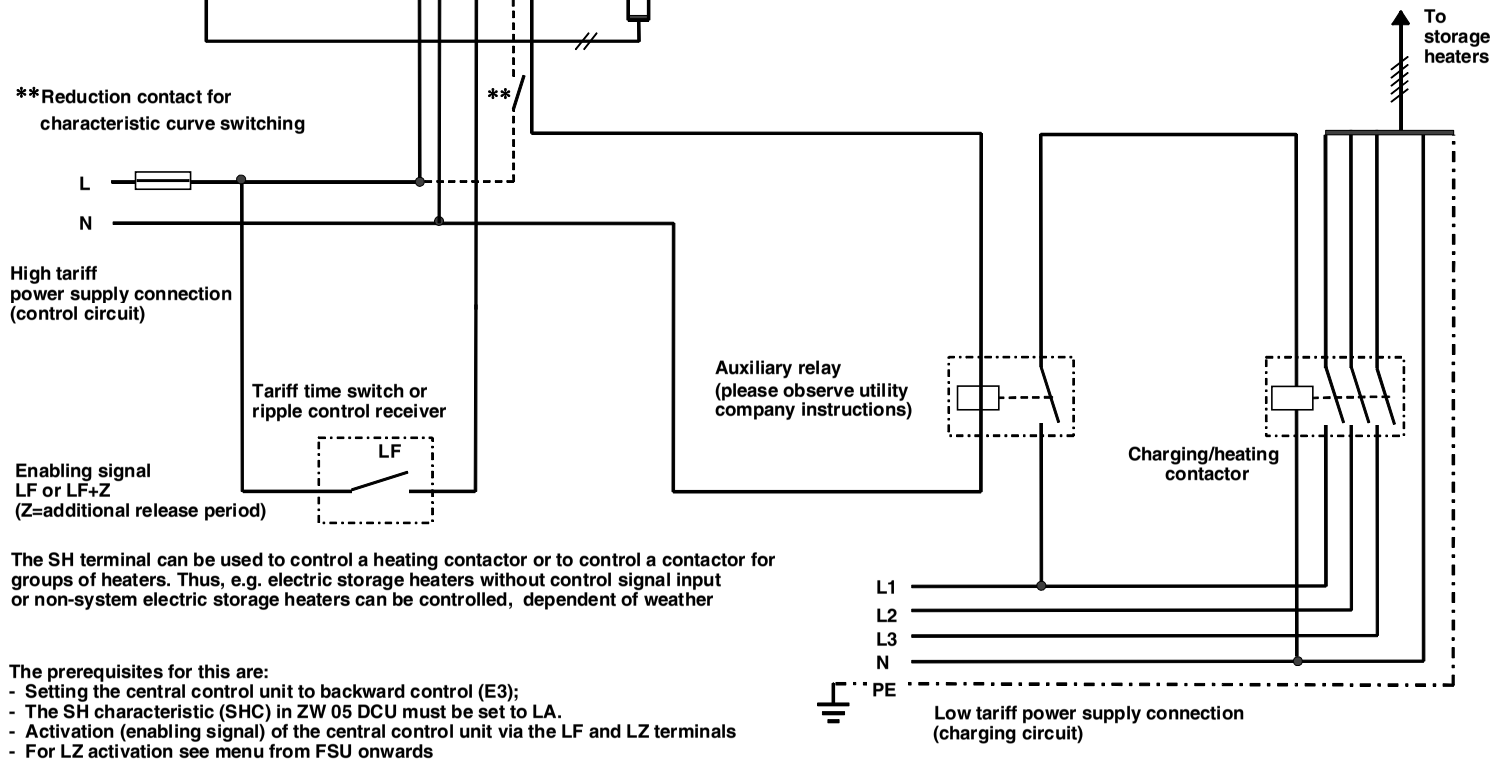
ZW 05 DCU connection diagram for underfloor heating


External sensor
Outside
Inside
Central control unit
Charge controller
AR 05DCU charge controller
Central control unit with control signal -2,85 ... -3,6V
KV/KU
Z1
Z2
KV
Z1+/I2
Z2-/I1
TF
TF1
TF2
TF3
TF4
-2,85 ... -3,6V
Transmission of control signal of any electric storage heaters
To electric storage heaters
* Reduction contact (optional) for characteristic curve switching to KU terminal
** Switching off the heating element that includes the residual heat sensor necessitates switching off all heating elements of the same heating circuit
L1
N
Enabling signal (LF or LZ) tariff time switch or ripple control receiver Example
LF
Enabling signal LF and LZ separate tariff time switch or ripple control receiver Example B
Residual heat sensor
Heating circuit contactor1
Main contactor
Underfloor storage heating
To further heating circuits
L1
L2
L3
N
PE
Power supply connection (heating circuit)
Room temp. controller
with floor temperature limiter
Peripheral zone heating
High tariff power supply connection
The SH characteristic "SHC" in the menu of the ZW 05 DCU central control unit must be set to "LF".

The ZW 05 DCU microprocessor-driven charge control has 2 separate control signal outputs.
The charge controllers for underfloor storage heating AR 05DCU or storage heaters can be connected to the Z1+, Z2- terminals (0.91 ... 1.43V). Charge controllers for underfloor storage heaters with control signal -2.85 ... -3.6 V (e.g. Type AR 1741 ... AR 1744, RFV 351 DC ... RFV 354 DC) to terminals I1, I2 .

ZW 05 DCU connection diagram: External-temperature-dependent control via SH (heating contactor activation terminal) control output (with SH characteristic SHC (terminal output characteristic) = LA (runtime))





The SH terminal can be used to control a heating contactor or to control a contactor for groups of heaters. Thus, e.g. electric storage heaters without control signal input or non-system electric storage heaters can be controlled, dependent of weather

The prerequisites for this are:
- Setting the central control unit to backward control (E3);
- The SH characteristic (SHC) in ZW 05 DCU must be set to LA.
- Activation (enabling signal) of the central control unit via the LF and LZ terminals
- For LZ activation see menu from FSU onwards

The SH output is switched (L potential) when a release is pending at the central control unit (LF terminal activated), and when a set charge rate of > 0 % is calculated, dependent upon the outside temperature and the runtime.

Direct control via charge control line Z1+/Z2-

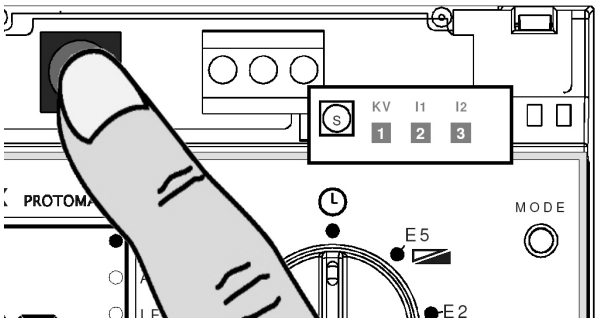
The ZW 05 DCU microprocessor-driven charge control can be used for direct control of storage heaters with electric charge controller via the charge control line (signal: 0.91 to 1.43 V DC).
For direct control via the charge control line Z1+/Z2-, the network connection does not lead through the heating contactor, but directly to the connection terminals of the storage heater. L1, L2 and L3 terminals have a constant voltage.

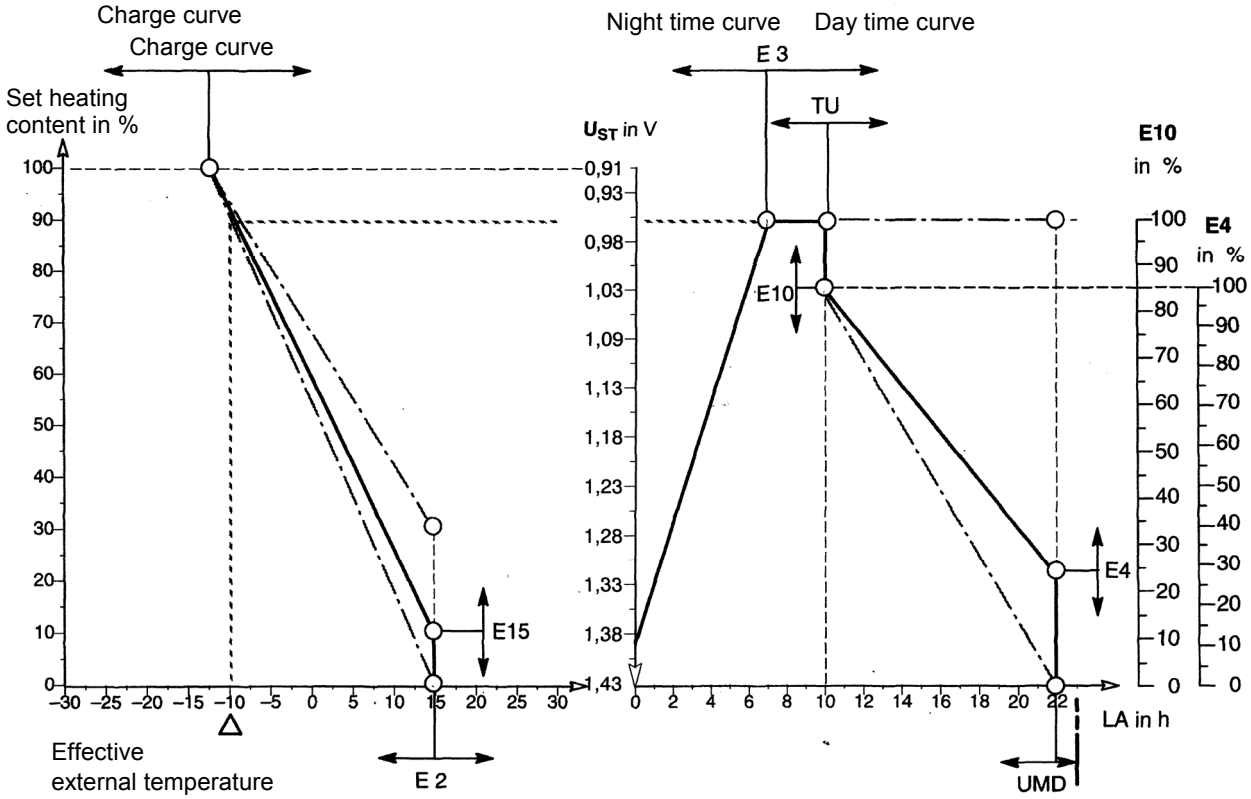
Activation for charge release is switched by the utility company via the charge control. At the Z1+/Z2- terminals, the weather-dependent and runtime-dependent control voltage is only active with activation of “LF” (with LF or SH) or “LZ” terminals.
For non-activated terminals “LF" or “LZ”, the central control unit provides a control voltage of 1.95 V, thus locking the charging of the storage heater.

Setting the Charge Control

The charge control should only be set by an experienced technician.

The ZW 05 DCU microprocessor-driven charge control is preset as backward control for an 8-hour lower tariff release period only. If adjustments to the technician menu are necessary, **configuration mode** must be activated by pushing the “Sondereinstellungen” (special settings) button.





Setting Examples

Charge type	Duration of release period tF	Duration of additional release period tZF	External temp. θ_a acc. to DIN EN 12831	Characteristic curve adjuster						
				Charge start **E2***	Base charge start **E15**	Additional charging **E10**	Full charge **E1**		Main charging period **E3**	Minimum base **E4**
							Storage heating devices	Underfloor heating		
8 + 0 h	Between 9 p.m. and 7 a.m. 8 h Backwards	-	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	Not effective	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	**	7 h	Not effective
8 + 2 h	Between 9 p.m. and 7 a.m. 8 h Backward	Between 1 p.m. and 4 p.m. 2 h Secondary	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	100 %	- 4 °C - 6 °C - 7 °C - 9 °C - 10 °C	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	7 h	25 %
8 + 4 h	8 h Spread	4 h Secondary	- 10°C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	100 %	0 °C - 1 °C - 3 °C - 4 °C - 5 °C	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	4 h	30 %
8 + 7 h	Between 9 p.m. and 7 a.m. 8 h Backwards	Between 12 p.m. and 9 p.m. 7 h Secondary	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	100 %	+ 4 °C + 3 °C + 3 °C + 1 °C 0 °C	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	7 h	30 %
9 + 0 h	Between 9 p.m. and 7 a.m. 9 h Backwards	-	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	Not effective	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	**	8 h	Not effective
9 + 2 h	Between 9 p.m. and 7 a.m. 9 h Backward	Between 1 p.m. and 4 p.m. 2 h Secondary	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	100 %	- 4 °C - 6 °C - 8 °C - 10 °C - 11 °C	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	8 h	25 %
10 + 0 h	Between 8 p.m. and 6 a.m. 10 h Backward	-	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	Not Effective	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	**	9 h	Not Effective
10 + 6 h	Between 8 p.m. and 6 a.m. 10 h Backward	Between 12 p.m. and 6 p.m. 6 h Secondary	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	E.g. + 15 °C	E.g. 15 %	100 %	+ 1 °C + 0 °C - 1 °C - 2 °C - 4 °C	- 10 °C - 12 °C - 14 °C - 16 °C - 18 °C	9 h	30 %

* Should the base charge start E15 be set to 0%, we recommend correcting the charge start to +20° C.
** Charge type without additional release periods in combination with underfloor storage heating is not recommended.

Notes for systems with storage heating devices and charge types with secondary additional release periods:

- Should external temperatures vary from those given in this table, then the full charge E1 characteristic curve adjuster should be set as follows:

$$E1 = 20\,°C - \frac{t_F}{t_F + t_{ZF}} * (20\,°C - \theta_e)$$

- For secondary, additional high-tariff release periods (tZF), activating the daytime skip (TAS (daytime skip) = E1) is recommended.

Input Menu of the Microprocessor-Driven Charge Control for Technicians

If the forward button [▼] be held down for approx. 10 seconds, the unit will switch into the **display mode (technician menu).** In the display mode menu for technicians, the LED display (green) is lit during display mode and the configuration settings can be accessed via the "▼" und "▲" buttons. Changing the settings is not possible.
Should no button be pushed in the active display mode for a period of approx. 3 minutes, the unit automatically returns to the operator mode after this time has elapsed. You can also exit the display mode by holding down the forward button [▼] for 10 seconds. The menu item selected via the rotary switch will be displayed.

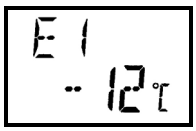
Should the setting parameters in the technician menu need to be changed, then the **configuration mode** is activated by pushing the “Special Settings” button.

In configuration mode, the LED display is lit (red) and the configuration settings can be accessed via the “▼” and “▲” buttons. The flashing menu item can be changed via the "Plus" [+] and "Minus" [-] buttons. Changes will be made automatically with the adjustment and saved upon exiting the configuration mode. By pushing the button “Sondereinstellungen” (special settings), or if 3 minutes have elapsed and no change has been made, the control unit returns back to the selected status display. Exception: if the charge rate service function SEL % is activated, the display remains set on this menu item for 4 hours. The backlighting of the display goes out after approx. 3 minutes.

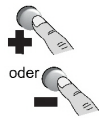
Menu item / display	Comment	Adjustment

START Technician Menu

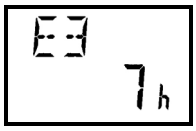
Full charge E1 [-25 ... 15°C]



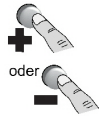
The full charge E1 indicates the effective external temperature (ATW) from which full charging on the charge controller is determined via the charge control. (The setting depends upon the charge type and the location of the system)



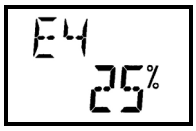
Main charging period E3 [0... 14 hours]



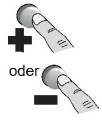
The main charging period E3 determines the runtime hour in which the night-time characteristic curve reaches the weather-dependent set charge rate. Attention: do not set E3 higher than the lower tariff release. For backward control: E3 = tF (release period) - 1 h
For spread control: E3 = tF (release period) - 0.5 h
For forward control: E3 = 0 h
(e.g. 8-hour lower tariff release and backward control E3 = 7 h)



Minimum base E4 [0 ... 100%]

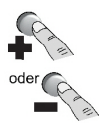


For charge types with daytime charging periods, the minimum base E4 determines the amount of residual heat base at the end of the daytime characteristic curve.
Note: when setting the E4, please observe the tariff requirements of the utility company. The E4 adjuster does not function during simultaneously activated “LF” and “LZ” terminals (forward control).

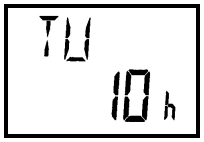


Daytime skip (TAS) [E1 / NEIN (no) / -10...10°C]

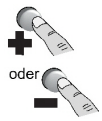
Adjuster for automatic external temperature-dependent suppression of daytime charging,
TAS (daytime skip) = E1: Daytime charging, e.g. with higher tariff release, suppressed to the full charge temperature set with E1.
TAS (daytime skip) = NEIN (no): Daytime skip is switched off; daytime charging will carry on depending upon the characteristic curve adjusters E10 and E4.
TAS (daytime skip) = ...°C Daytime charging, e.g. at higher tariff release, is suppressed to an adjustable effective external temperature (-10 to 10°C).



Daytime switching (TU) [6...14 hours]



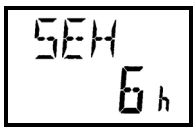
Daytime switching (TU) determines the runtime point at which the microprocessor-driven charge control switches from night-time to daytime characteristic curve.



Technician Menu (continued)

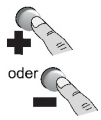
Menu item / display	Comment	Adjustment

Lock (SEH) [0...8 hours]

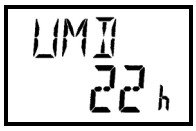


The lock (SEH) determines the moment at which the microprocessor-driven charge control switches into lock status. In lock status, the timing element runs independent of LL (runtime) or LL/LF (charge release) activation until the circulation period has ended.

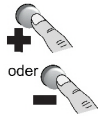
The lock setting is calculated based upon the release period tF (release period) - 2 h, and exceed the additional release period.



Circulation period UMD

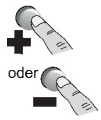


The circulation period (UMD) determines the runtime after which a new daytime cycle can be activated by starting the timing element (LL activation) of the microprocessor-driven charge control.

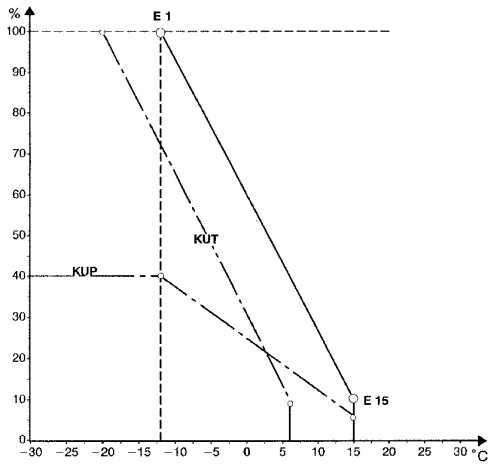


Characteristic curve switching (KU) [KUT (characteristic curve switching, temperature) / KUP (characteristic curve switching, percent)]

In active mode, the characteristic curve switching KU (activation of the KU terminal or automatic program for lowering) is followed by switching to one with a KUT (characteristic curve switching, temperature) or KUP (characteristic curve switching, percent) adjustable, second charge curve.



Heating content



Effective external temperature

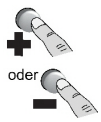
KUT (characteristic curve, temperature) =… °C [5 to 15°C]
With KUT (characteristic curve, temperature) and characteristic curve switching (KU) in active mode (lowered or frost-protected operation), a second charge curve is activated that provides an adjustable charge start (KUT (characteristic curve, temperature) in °C) via a parallel shift of the charge curve determined by E1, E2 and E15.

KUP (characteristic curve switching, percent) = … %: [0 to 100%]
For KUP (characteristic curve switching, percent) and activated KU terminals, a second characteristic curve (proportional reduction) is activated. The charge curve determined by E1, E2 and E15 is thereby proportionally reduced to the value set with KUP (characteristic curve switching, percent).

External temperature averaging (ATM) [JA/NEIN (yes/no)]

For active external temperature averaging (ATM = JA (yes)), the daytime temperature average value (calculated according to a mathematical formula) is used to determine the set charge rate. (Compensation for larger temperature fluctuations, low night-time and high daytime temperatures during transition periods.)

Attention: for active external temperature averaging (ATM = Ja (yes)), the effective external temperature (ATW) displayed is the averaged temperature.



Technician Menu (continued)

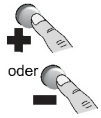
Menu item / display	Comment	Adjustment

Type of external sensor

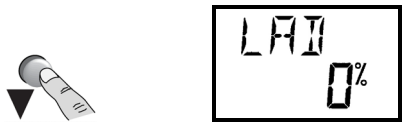
The control can be connected to an NTC-DIN sensor or to a PTC sensor (700 Ohm at 20 °C). The automatically identified sensor type is displayed. Correction of the external-temperature measured value is possible [-10 to 10 °C].

Correction of the external sensor should only be carried out if the location installation of the sensor is known and the temperature of the sensor or wall (depending on the individual installation) can be measured! External temperature averaging must be switched off during measurement (ATM (external temperature averaging) = NEIN (no)).

(For example: If the ATW (effective external temperature) is 4 ° too low compared to the measured value, then a corrected value of “4 °C” should be set via the “+” button.)



Set charge rate (LAD) [Display 0... 100%]



Display of the current set charge rate (LAD) in %, calculated by the central control unit.
The interrelationship between the set charge rate and the control voltage is as follows:

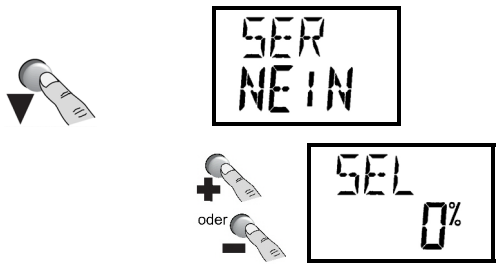
Not possible

Set point charge rate	Control voltage (UST) LAD (charge)	Z1+/Z2-	I1/I2
Charge start 0%	1.43 V 1)	-3.60 V 2)	
10%	1.38 V	-3.53 V	
20%	1.33 V	-3.45 V	
30%	1.27 V	-3.38 V	
40%	1.22 V	-3.30 V	
50%	1.17 V	-3.23 V	
60%	1.12 V	-3.13 V	
70%	1.07 V	-3.08 V	
80%	1.01 V	-3.00 V	
90%	0.96 V	-2.93 V	
Full charge 100%	0.91 V	-2.85 V	

Safety overlap for charge suppression (without LF (charge release) or LZ (additional charging)) to:

1) 1.95 V 2) -4.35 V

Service function (SER) [NEIN/JA (no/yes)]

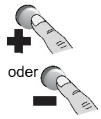


Switching to SER (service function) = JA (yes) provides the option of targeted checking of a storage heating system by selecting the service charge rate (SEL) in %.

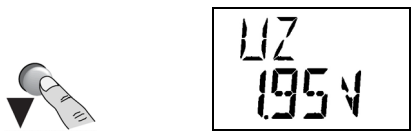
- SEL (service charge rate) 0%
Provides a control signal from > 1.43 V or < -3.60 V. System or units may not access the network.

- SEL (service charge rate) 1% to 100%
Output of a control signal corresponding to the LAD shown in the table above. System or units can access the network when set to 100% (Exception: system is fully charged).

The service function switches off automatically after a period of 4 hours or after exiting the menu item.



Control voltage at the terminals (UZ) [Display]



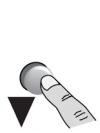
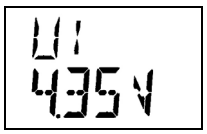
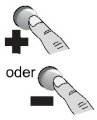
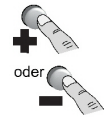
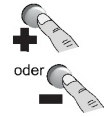
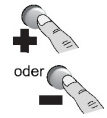
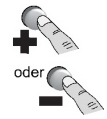
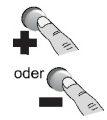
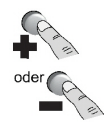
Displays the calculated control voltage between the Z1+/Z2- control terminals.

0.91 – 1.43 V: effective control voltage range during which charging occurs

1.95 V: Charging is locked in the case of non-activated “LF” (charge release) or “LZ” (additional charging) terminals

Not possible

Technician Menu (continued)

Menu item / display	Comment	Adjustment
Control voltage at the terminals (UI)[Display]		
 	Displays the calculated control voltage between the I1/22 control terminals. -2.85... -3.6 V: effective control voltage range within which charging occurs -4.35 V: Charging is locked in the case of non-activated “LF” (charge release) or “LZ” (additional charging) terminals.	Not possible
*** Release synchronisation with timer (FSU) [NEIN/JA (no/yes)]**		
	If FSU = JA (yes) is set, the release synchronisation with timer is active. The runtime (LA) is then coupled with the real-time timer and can no longer be changed. Synchronisation takes place automatically at LFS (earliest start of release). (The terminal functioning of LL (runtime), LF (charge release) and LZ (additional charging), and the functioning of the lock remain unchanged.) If, in normal operation, the runtime (LA) is not LA = 00.00 hours at the time of LFS (earliest start of release), it will be set to 00.00 hours. Operating mode FSU (release synchronisation with timer) = JA (yes) in connection with LSU (charge synchronisation with timer) = JA (yes) can be used to release time-controlled charging in periods without release signals or during very long release periods. During time periods in which charging is not to occur, a 100% operating time safety overlap will be released.	
**** Earliest start of release (LFS) [00:00…23:59]**		
	Earliest point in time at which accumulator charging can take place when LF or LZ are activated. (Starting point of runtime (LA) with LSU (charge synchronisation) = JA (yes))	
**** Maximum duration of release (LFD) [00:00 to 23:59 h]**		
	Maximum duration of accumulator charging during the night-time release period	
**** Earliest start of additional release (LZS) [00:00 to 3:59]**		
	Earliest point in time at which additional accumulator charging can take place when LF or LZ are activated.	
**** Maximum additional release duration (LZD) [00:00 to 3:59]**		
	Maximum duration of charging during the additional release period	
**** Synchronised charging via timer (LSU) [NEIN/JA] (no/yes)**		
	To activate synchronised charging secondary to the utility company control signals via an integrated timer, the parameter LSU = JA (yes) is to be programmed. Active synchronised charging is indicated in the display by the “Uhr” (timer) symbol	

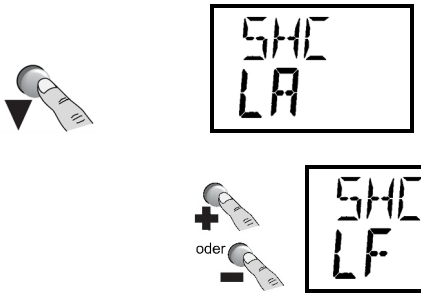
* Only appears in the menu if the real-time timer is set to “JA” (yes) in the operator menu

** Only appears in the menu if both the real-time timer is set to “JA” (yes) and menu item “FSU (release synchronisation with timer) = JA (yes)” is set in the operator menu

Technician Menu (continued)

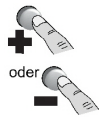
Menu item / display | **Comment** | **Adjustment**

SH terminal output characteristic (SHC) [LA/LF (runtime / charge release)]

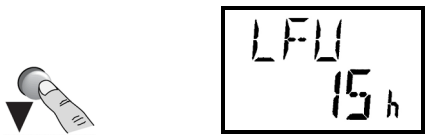


SHC (terminal output characteristic) = LA (runtime): Runtime-controlled contactor output for activation of a heating contactor or activation of a contactor for groups of heaters.

SHC (terminal output characteristic) = LF (charge release): According to DIN 44576, release period detection is additionally required for underfloor storage heating. Charging is switched off as soon as the totalled release periods (LF and LZ activation) within a circulation period exceed the set value found under menu item “LFU” (charge release detection). This is indicated in the display with the "LFÜ" symbol. This is automatically reset after the start of the next daytime cycle.

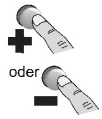


* Charge release detection (LFU) [6 ... UMD (circulation period)]

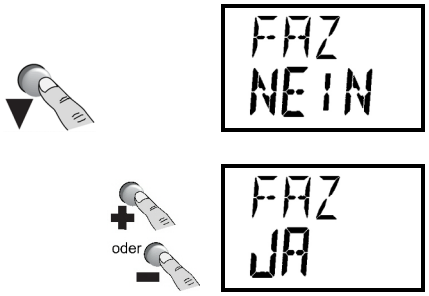


Maximum release period within a charging cycle (factory default) LFU (charge release detection) = 15 hours; setting range 0… UMD (circulation period)).

Note: The LFU (charge release detection) = UMD (circulation period) setting switches off runtime detection. In connection with an underfloor storage heater, the use of an additional, independently switching ground temperature limiter is required for every heating circuit.

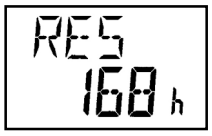


* Initial underfloor heating cycle (FAZ) [NEIN/JA (no/yes)]

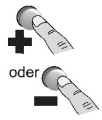


If the initial underfloor heating cycle FAZ = JA (yes) is activated, controlled initial heating of the insulating screed occurs over a period of 168 hours (7 days). Hereby is charging gradually increased.

Duration	Remaining runtime	Set charge rate
Day 1	168 to 145 hours	14%
Day 2	144 to 121 hours	29%
Day 3	120 to 97 hours	43%
Day 4	96 to 73 hours	57%
Day 5	72 to 49 hours	71%
Day 6	48 to 25 hours	86%
Day 7	24 to 0 hours	100%



The remaining runtime of the initial heating programme is displayed in hours. After the 7th daytime cycle has elapsed, the basic characteristic curve is returned to. After exiting the configuration mode, the remaining runtime is displayed in place of runtime (LA).



** SH daytime heating contactor activation output (SHT) [NEIN/JA/AN% (no/yes/to%)]

When operating the central control unit as backward control, the SH heating contactor activation terminal can be used to activate a heating contactor or to activate a contactor for groups of heaters. Thus, for example, weather-dependent control of storage heaters without control signal input is possible.

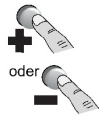
SHT (daytime heating contactor activation output) = NEIN (no): If the LF (charge release) or LZ (additional charging) signal is connected, runtime is **LA (runtime) ≤ TU (daytime switching),** and the calculated set charge rate is greater than 0%, the SH terminal switches the L (charge) signal through.

SHT (daytime heating contactor activation output) = JA (yes): If the LF (charge release) or LZ (additional charging) signal is connected and the calculated set charge rate is greater than 0%, the SH terminal switches the L (charge) signal through.

SHT (daytime heating contactor activation output) = AN% (to%)
This menu item can only be selected if FSU (release synchronisation with timer) = JA (yes) and >00:00 hours is set for LZD (additional release duration).

SHT (daytime heating contactor activation output) = AN% (to%) and LA (runtime) ≤ TU (daytime switching)
If the LF (charge release) or LZ (additional charging) signal is connected and the calculated set charge rate is greater than 0% (with a hysteresis of 4%), The SH terminal switches the L (charge) signal through.

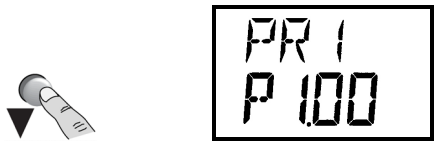
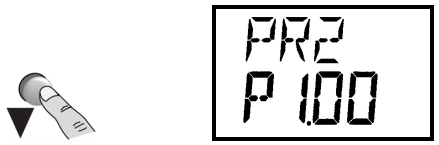
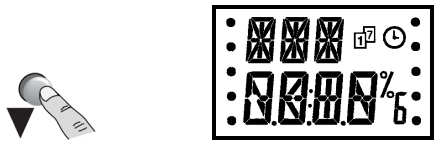
SHT (daytime heating contactor activation output) = AN and LA (runtime) > TU (daytime switching)
The SH terminal switches the L (charge) signal through within a release period LZD (additional release duration) (for the duration LZD x LAD (set charge rate) at the LZB/100 point in time) if the LF (charge release) or LZ (additional charging) signal is connected.



* Only appears in the menu if the menu item "SHC (terminal output characteristic) = LF (charge release)" is set

** Only appears in the menu if the menu item “SHC (terminal output characteristic) = LA (runtime)” is set

Technician Menu (continued)

Menu item / display	Comment	Adjustment
Program version T1 **[Display]** 	Program version µP 1	Not possible
Program version T2 **[Display]** 	Program version µP 2	Not possible
Segment test **[Display]** 	All display segments of the LC display are activated	Not possible

END of Technician Menu

Software reset

A software reset returns **all** settings to factory defaults.

1. Configuration mode is activated by pushing the button “Sondereinstellungen” (special settings) (‘“MODE” LED is lit red)
2. Press the forward button [▼] and backward button [▲] simultaneously for 60 seconds.
3. A brief change in colour of the LED display from red to orange indicates that the software reset was successful.

Start-Up

External temperature display (ATW – effective external temperature)

When the central control unit is connected to voltage, it takes approx. 1 minute for the external temperature to be correctly calculated and displayed.

Setting the runtime (LA) when operating the charge control with timer function

The charge control features automatic runtime synchronisation. Upon leaving the factory, the runtime is set to 0.00 h. For charge types with strictly night-time charging (e.g. 8 + 0 h), this setting need not be changed. The charge control synchronises itself during the next lower tariff release. For charge types with additional charging periods during the day, the runtime must be adjusted at start-up.

To do this, proceed as follows:
Subtract the starting point of the night-time (NT) release from 24 and add the current time to this result.

For example: The start of the lower tariff release is 10 p.m.; the current time is 10:15 a.m.
24:00 h – 22:00 h + 10:15 h = 12:15 h
→ The runtime (LA) must be set to 12:15 p.m. (see operator menu)

Note: The runtime cannot be changed if the real-time timer is activated (Uhr (timer) = JA (yes)) in combination with FSU (release synchronisation with timer) = JA (yes).
This automatic runtime synchronisation occurs automatically at the earliest start of release (LFS).

Start-up for underfloor heating

Initial heating of screed flooring according to the appropriate standards and guidelines, taking special specifications into consideration, can only occur after the minimum wait time has expired. The simple initial start-up of underfloor storage heating can be carried out via the automated underfloor initial heating cycle (menu item FAZ (initial underfloor heating cycle)) of the charge control.
This function can be accessed in the configuration mode of the technician menu via the forward button [▼] or the backward button [▲], and activated or deactivated using the "+" / "-" buttons. After activation, a set charge rate of 14% is specified, starting with the first of the following charge release periods. The charge rate values of the following days are to be taken from the table. If a value of 45 °C is set on the E6/AT (external temperature) adjustor when charge controllers are connected, and the E8/KT (daytime) or E7/KN (night-time) correction adjuster is brought to the neutral position, then the following maximum set temperatures will result:

Day	1	2	3	4	5	6	7
Set charge rate Temperature	14% 23.5 °C	29% 27.1 °C	43% 30.7 °C	57% 34.3 °C	71% 37.9 °C	86% 41.4	100% 45.0 °C

The current characteristic curve is returned to after Day 7. The remaining runtime is displayed in hours.
The maximum permissible switch-off temperature (E6/AT (external temperature)) on the charge controller should be set after consultation with the screed manufacturer or your screed flooring contractor. This adjustment should be carried out according to the installation and operating instructions of the charge controller.

Storage heater start-up

For initial start-up of storage heaters, the following must be charged according to your installation and operating instructions.

Start-Up Protocol

	Operator menu abbreviation	Operator menu designation	Operator menu factory default	Date of value setting:	Date of value change:
Operator Menu	LA/RES	Runtime	0 h/168 h		
	E5	Charge level	0%		
	E2	Charge start	15 °C		
	E15	Base charge start	15%		
	E10	Additional charging	85%		
	ATW	Effective external temperature	External temperature display		
	Uhr	Real-time timer	No	No ☐ Yes ☐	No ☐ Yes ☐
	*TAE	Day setting	T 1		
	*Anz	Display	AS	AS ☐ Time ☐ AU ☐	AS ☐ Time ☐ AU ☐
	*Abw	Days of absence	0 T		
	*Wop	Weekly programme	No	No ☐ Yes ☐	No ☐ Yes ☐
	**MO Nor/MO KU	Monday	Nor	Nor ☐ KU ☐	Nor ☐ KU ☐
	**DI Nor/DI KU	Tuesday	Nor	Nor ☐ KU ☐	Nor ☐ KU ☐
	**MI Nor/MI KU	Wednesday	Nor	Nor ☐ KU ☐	Nor ☐ KU ☐
	**DO Nor/DO KU	Thursday	Nor	Nor ☐ KU ☐	Nor ☐ KU ☐
	**FR Nor/FR KU	Friday	Nor	Nor ☐ KU ☐	Nor ☐ KU ☐
	**SA Nor/SA KU	Saturday	Nor	Nor ☐ KU ☐	Nor ☐ KU ☐
	**SO Nor/SO KU	Sunday	Nor	Nor ☐ KU ☐	Nor ☐ KU ☐

* Only for setting "Uhr (timer) = JA (yes)"; ** Only for setting "WoP (weekly programme) = JA (yes)"

Technician Menu	Technician menu abbreviation	Technician menu designation	Technician menu factory setting	Date of value setting:	Date of value change:
	E1	Full charge	- 12 °C		
	E3	Main charging duration	7 h		
	E4	Minimum charging base	25%		
	TAS	Daytime skip	E1		
	TU	Daytime switching	10 h		
	SEH	Lock	6 h		
	UMD	Circulation period	22 h		
	KUT/KUP	Characteristic curve switching (temperature/percent)	7 °C/ 40 %		
	ATM	External temperature averaging	Yes	No ☐ Yes ☐	No ☐ Yes ☐
	NTC/PTC	Type of external sensor	NTC 0 °C	NTC __ °C PTC __ °C	NTC __ °C PTC __ °C
	LAD	Set charge rate	Charge rate display		
	SER	Service charge rate	No		
	UZ	Control voltage at Z1 terminal	Display of control voltage at terminal Z1		
	UI	Control voltage at I1 terminal	Display of control voltage at terminal I1		
	FSU	Release synchronisation with timer	No	No ☐ Yes ☐	No ☐ Yes ☐
	*LFS	Earliest start of release	9:00 p.m.		
	*LFD	Maximum duration of release	8 h		
	*LZS	Earliest start of release	9:00 p.m.		
	*LZD	Maximum additional release duration	0 h		
	*LSU	** Synchronised charging with timer	No	No ☐ Yes ☐	No ☐ Yes ☐
	SHC	SH terminal output characteristic	LA	LA ☐ LF ☐	LA ☐ LF ☐
	**LFU	Charge release detection	15 h		
	**FAZ	Initial underfloor heating cycle	No	No ☐ Yes ☐	No ☐ Yes ☐
	**RES	Remaining runtime (only for “FAZ Ja (yes)“)	Remaining runtime display (initial underfloor heating cycle)	See LA/RES	See LA/RES
	SHT	Daytime heating contactor activation output	No	No ☐ Yes ☐ ON ☐	No ☐ Yes ☐
	PR1	Program part version 1	Display program version µP 1		
	PR2	Program part version 2	Display program version µP 2		
		Segment test			

* Only for setting "FSU (release synchronisation with timer) Ja (yes)". ** Only for setting "SHC (terminal output characteristic) LF (charge release)"

Correcting Basic Settings

The recommended basic settings are standard values that may have to be changed according to the type and location of the building, the installation location of the external sensor, the release and additional release periods, the requirements of the corresponding utility company and individual user preferences.

If changes are made, please note that corrections will only become apparent on the following day after the unit has been charged. Changes to the charge control affect the entire heating system!

Changing the charge level

The basic charge level of the heating system can be changed via the **E5 charge level** adjuster (operator menu).

> In order to **increase charging**, the **E5** adjuster must be adjusted **to the plus range**.
> **Adjustment to the minus range** leads to a **decrease** in charging.

Systems without daytime additional charging period

Fault description	External temperature	**Adjuster corrections**		
		E1	E2	E15
Insufficient charging	Colder than 0 °C	+ 3 °C	-	-
	Between 0 °C and 10 °C	+ 2 °C	+ 2 °C	+ 5%
	Warmer than 0 °C	-	+ 3 °C	+ 5%
Excess charging	Colder than 0 °C	- 2 °C	-	-
	Between 0 °C and 10 °C	- 2 °C	- 2 °C	- 5%
	Warmer than 0 °C	-	- 2 °C	- 5%

Systems with daytime additional charging period

Fault description	External temperature	**Adjuster corrections**						
		E1	E2	E15	E4	E10	TAS	TAS °C
Insufficient charging	Colder than 0 °C	+ 3 °C	-	-	-	-	-	
	Between 0 °C and 10 °C	+ 2 °C	+ 2 °C	+ 5 %	-	-	-	
	Warmer than 0 °C	-	+ 3 °C	+ 5 %	-	-	-	
Excess charging	Colder than 0 °C	- 2 °C	-	-	-	-	-	
	Between 0 °C and 10 °C	- 2 °C	- 2 °C	- 5 %	-	-	-	
	Warmer than 0 °C	-	- 2 °C	- 5 %		-	-	
Insufficient or no daytime charging	Warmer than E1 or TAS °C (daytime skip °C)	-	-	-	-	-	No	+ 3 °C
	Colder than E1 or TAS °C (daytime skip °C)	-	-	-	+ 10%	+ 10%	-	-
Daytime charging is too high	Warmer than E1 or TAS °C (daytime skip °C)	-	-	-	-	-	E1	- 3 °C
	Colder than E1 or TAS °C (daytime skip °C)	-	-	-	- 10%	- 10%	-	-

"+" → set value to increase the specified amount; "-" → set value to decrease the specified amount

Diagnostic Information

Thanks to its design and construction, the ZW 05 DCU microprocessor-driven charge control can be used in storage heating systems with heating contactor, and for storage heating systems with direct control via the charge control line (Z1+/Z2-), without a heating contactor. Thus, the weather-dependent and runtime-controlled control voltage is applied to the Z1+/Z2- terminals of the central control unit only with activation of the LF (charge release) or LZ (additional charging) terminals. With a non-activated LF or LZ terminal, the central control unit always releases a control voltage of 1.95 V to the Z1+/Z2- terminals (- 4.35 V to the I1/I2 terminals). Therefore, to check the control voltage signal it is necessary to activate the LF terminal (charge release) or LZ (additional charging).

Table of measured values for checking the control voltages

To check the control signal of the central control unit, the following switching and/or settings are necessary:

1. Establish LF (charge release) activation
2. Set LA (runtime) adjuster to a value between E3 and daytime switching (TU) (= end of the nightime characteristic curve)
3. Charge start adjuster E2 = 15 °C
4. Full charge adjuster E1 = -12 °C
5. Base charge start adjuster E15 = 0%

Effective external temperature (ATW)	°C	20	16	12	8	5	0	- 5	- 10	- 15	- 20
Control voltage to Z1+/Z2-	V	1.68	1.68	1.37	1.30	1.24	1.14	1.05	0.95	0.91	0.91
Control voltage to I1/I2	V	-3.60	-3.60	-3.52	-3.41	-3.32	-3.18	-3.04	-2.91	-2.85	-2.85

After measurements have been made, the original switching and setting of the microprocessor-driven charge control should be re-established.

Testing the NTC or PTC external sensor

Set the rotary switch to the external temperature display (“ATW”). In the charge control display, the effective external temperature is indicated that serves as the basis for calculating the control voltage.
In order to carry out a plausibility test (i.e. does the temperature measured via the external sensor correspond with the displayed temperature ATM?), external temperature averaging (ATM) must be switched off during testing (ATM = Nein (no)). In the case of active external temperature averaging (ATM = JA (yes)), it is not the current temperature of the external sensor that is indicated in the display, but the averaged external temperature.

Temperature of external sensor	°C	20	16	12	8	4	0	- 4	- 8	- 12	- 16	- 20
NTC external sensor (series)	kΩ	2.43	2.85	3.36	3.98	4.73	5.64	6.76	8.14	9.84	11.96	14.62
PTC external sensor (Bauknecht sensor)	Ω	700	692	684	676	668	660	652	644	636	628	620

Error messages

An error recognized by the central control unit is indicated with the corresponding fault code F… in the display; the display will flash.

WFU **F001**	Weather sensor interruption	Check weather sensor and replace if necessary
WFK **F002**	Weather sensor short-circuit	Check weather sensor and replace if necessary
F003 :	Fault code from F003 onwards => unit error	Unit replacement necessary

In case of voltage cutoff

The central control unit has a power reserve of approx. 6 hours.
In the case of a voltage interruption exceeding approx. 6 hours, time of day must be set if the real-time timer is activated.

After-Sales Service

For customer service, please contact the Robert Bosch Hausgeräte GmbH.
To process your order, we require the production number **E-no**. and the production date (**FD)** of the unit.
This information can be found on the type plate.

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The Robert Bosch Hausgeräte GmbH is available for you 7 days a week, 24 hours a day!
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